In the Claims

1. (Original) A method of processing imaging data for a radiation emitting medical imaging device, the method comprising:

receiving an image application identifier;

receiving a set of scan parameter values;

automatically generating a predicted noise index from the received set of scan parameter values;

generating an X-ray tube current profile based at least on the predicted noise index;

allowing user override of the automatically generated predicted noise index based on the X-ray tube current profile and setting a preferred noise index if so selected by a user, and if a preferred noise index is set, generating a final tube current profile; and

acquiring imaging data with the final tube current profile.

2. (Original) The method of claim 1 wherein the step of determining the preferred noise index further comprises the step of adjusting the automatically generated predicted noise index according to a direct user input.

3. (Original) The method of claim 2 wherein the direct user input defines a target noise index for scanning and processing an image.

4. (Original) The method of claim 1 further comprising the steps of:

initiating a pre-scan of a subject;

acquiring pre-scan imaging data;

generating a scout image from the pre-scan imaging data;

displaying the scout image; and

displaying a tube current profile for a selected diagnostic quality, wherein one or more portions of the tube current profile are adjustable.

5. (Original) The method of claim 1 further comprising the step varying the automatically determined predicted noise index according to a diagnostic current input.

6. (Original) The method of claim 1 wherein the step of automatically generating a predicted noise index further comprises the steps of:

receiving patient input;

accessing a patient demographic database;

generating a set of projections; and

predicting an image noise based on the generated set of projections.

7. (Original) The method of claim 1 wherein the step of automatically generating a predicted noise index further comprises the steps of:

receiving a diagnostic tube current value; and

predicting a noise index using a phantom reference and the diagnostic tube current value.

8. (Original) The method of claim 1 wherein the step of automatically generating a predicted noise index further comprises the steps of:

performing a scout scan to acquire pre-scan data; and

predicting a noise index using acquired pre-scan data.

9. (Original) The method of claim 1 wherein the preferred noise index is adjustable for sub-volumes in an VOI.

10. (Original) The method of claim 1 further comprising the step of varying a patient dose during a rotation of an x-ray source for one or more sensitive organ sub-volumes in an VOI.

11. (Original) The method of claim 6 wherein the patient input includes gender, age, weight, and anatomical volume data of a patient.

12. (Currently Amended) A method of processing imaging data for a radiation emitting medical imaging device, the method comprising:

acquiring imaging data of a subject;

generating a set of projections for an VOI having a plurality of sub-volumes;

acquiring a target noise index;

generating a tube current profile for a radiation emitting tube according to the target noise index; and

enabling interactive adjustment of the generated tube current profile to convey a dose specific for each sub-volume in the VOI such that diagnostic quality is variable across the VOI.

13. (Original) The method of claim 12 further comprising the step of varying an application of a patient dose for each rotation of an X-ray source within a sub-volume in the VOI to limit X-ray exposure to sensitive organs of a patient.

14. (Original) The method of claim 12 further comprising the step of plotting the tube current profile on a graphical user interface.

15. (Presently Presented) The method of claim 14 wherein user modulation of a portion of the plotted tube current profile on the graphical user interface causes the noise index to vary for the portion of the tube current profile modulated.

16. (Original) The method of claim 12 further comprising the step of adjusting at least one of a noise index and a relative dose index to acquire the imaging data of the subject.

17. (Original) The method of claim 12 wherein the step of interactively adjusting includes a direct adjustment of a noise index to acquire the imaging data of the subject.

18. (Original) The method of claim 12 wherein the step of generating a set of projections includes the steps of:

receiving a patient input; and

accessing a patient demographic database.

19. (Presently Presented) The method of claim 13 further comprising the step of generating an effective tube current profile based on the varied patient dose for each gantry rotation and plotting the effective tube current profile on a graphical user interface.

20. (Currently Amended) A computed tomography system comprising:

a high frequency electromagnetic energy projection source to project high frequency energy towards an object;

a detector to receive high frequency electromagnetic energy attenuated by the object;

a plurality of electrical interconnects configured to transmit detector outputs to a data processing system; and

a computer programmed to:

construct a plurality of initial projections for an VOI;

receive a user input to generate a target noise index;

generate a tube current profile for the high frequency electromagnetic energy projection source according to the target noise index and a predicted noise index;

display the tube current profile on a console wherein the tube current profile can be modulated for one or more portions of the VOI;

adjust a scan dose for one or more portions of the VOI based on user modulation of the tube current profile; and

acquire imaging data for the VOI.

21. (Original) The system of claim 20 wherein the computer is further programmed to display the plurality of initial projections on the console.

22. (Original) The system of claim 21 wherein the computer is further programmed to:

generate an effective tube current profile indicating a lower X-ray dose to a patient based on the asymmetry of the patient; and

display a graphical representation of the effective tube current profile on the console.

23. (Original) The system of claim 20 wherein the computer is further programmed to modulate the tube current profile based on a direct user target noise input for selected volumes of the VOI.

24. (Original) The system of claim 20 wherein the computer is further programmed to define the tube current profile by accessing a patient demographic database storing patient gender, age, weight, and anatomical data therein.

25. (Original) The system of claim 20 wherein the computer is further programmed to vary the tube current profile as a function of a gantry angle.

26. (Currently Amended) A computer-readable medium having stored thereon a computer program having a set of instructions that, when executed by a computer, causes the computer to:

acquire pre-scan data of an VOI of a subject;

generate a predicted noise index from the pre-scan data;

generate a tube current profile for a radiation source designed to project radiation at a subject during data acquisition based upon the predicted noise index and a target noise index; and

receive selective adjustments of at least a portion of the tube current profile to adjust a scan dose for a corresponding portion of the VOI based on user analysis of the tube current profile.

27. (Original) The computer-readable medium of claim 26 wherein the set of instructions further causes the computer to generate a visual display of the tube current profile and a scout image of the subject.

28. (Original) The computer-readable medium of claim 27 wherein the set of instructions further causes the computer to generate an effective tube current profile and graphically plot the effective tube current profile to display a lower tube current capable of generating an image of the subject.

29. (Original) The computer-readable medium of claim 26 wherein the subject includes a medical patient and the set of instructions further causes the computer to reduce dosage for acquiring imaging data of anatomical volumes sensitive to radiation, the anatomical volumes including eyes, ovaries, breasts, and gonads.

30. (Original) The computer-readable medium of claim 26 wherein incrementally varying a relative noise index adjusts the tube current profile.

31. (Original) The computer-readable medium of claim 26 wherein the set of instructions further causes the computer to adjust the tube current profile upon direct entry of a selected noise index by an operator.

32. (Presently Presented) A radiation emitting medical device comprising:

means for receiving scan parameters;

means for adjusting the scan parameters automatically to generate a desired target image quality across a VOI for a patient;

means for modifying a tube current profile based on the adjusted scan parameters to account for sub-volumes of elevated interest such that radiation dose to the sub-volumes of elevated interest exceeds that of other sub-volumes of the VOI; and

means for scanning the patient using the modified tube current profile to reconstruct an image of the patient with image quality for the sub-volumes of elevated interest exceeding that of the other sub-volumes of the VOI.

33. (Original) The medical device of claim 32 wherein the target image quality is determined by a target image noise index.

34. (Original) The medical device of claim 32 wherein the target image quality is determined by a diagnostic tube current and one of a reference phantom and a demographic database.

35. (Original) The medical device of claim 32 wherein the means for modifying a tube current profile includes one of graphical adjustment and direct entry adjustment.

36. (Original) The medical device of claim 32 wherein the means for modifying a tube current profile includes a means for modifying only a portion of the tube current profile.

37. (Original) The medical device of claim 32 wherein the means for modifying a tube current profile includes a means for modifying the tube current in sensitive organ regions for each gantry rotation.